

Bio/Diversity Project  
Invasive Species Cause Changes in Ecosystems

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Grade Level: 2<sup>nd</sup> grade

<b>Common Core Standard:</b>	<p><i>Strand 1, Concept 4: Communicate results of investigations.</i></p> <ul style="list-style-type: none"> <li>• <i>PO 1. Communicate the results and conclusions of an investigation (e.g., verbal, drawn, or written).</i></li> </ul> <p><i>Strand 4, Concept 2: Understand the life cycles of plants and animals.</i></p> <ul style="list-style-type: none"> <li>• <i>PO 3. Compare the life cycles of various organisms.</i></li> </ul>
<b>Content Objective:</b> Science	<ul style="list-style-type: none"> <li>• <i>Students will be able to define what an ecosystem is.</i></li> <li>• <i>Students will be able to describe how invasive species can affect other species and cause big changes in ecosystems.</i></li> </ul>
<b>Language Objective:</b> (Optional)	N/A

Vocabulary	Materials
<ul style="list-style-type: none"> <li>• Ecosystem</li> <li>• Invasive species</li> <li>• Predator</li> <li>• Prey</li> <li>• Species</li> </ul>	<ul style="list-style-type: none"> <li>• PowerPoint presentation that explains main concepts and introduces new vocabulary</li> <li>• Pictures of different species (can be cut out of nature magazines or pre-printed)</li> <li>• One picture of an ‘invasive’ species per group</li> <li>• Paper to write end summary on</li> </ul>
<p><b>Guiding Questions:</b></p> <ul style="list-style-type: none"> <li>• What is an ecosystem?</li> <li>• What is an invasive species? Can you give an example of an invasive species in the Sonoran Desert?</li> <li>• What are some of the effects that an invasive species can have on an ecosystem? Are all of these negative?</li> <li>• Who eats whom/what?</li> </ul>	

**Engagement/Introductory Activity:**

Introduce the concept of an ecosystem – ask students if they know what an ecosystem is. Break the word down into “eco” and “system” and then ask students to give examples of large and small ecosystems in the Sonoran Desert.

Talk about invasive species that students may already be familiar with – buffelgrass, crayfish, imported red fire ants, etc. – and how it has impacted other species in the Sonoran Desert. Make sure to point out that not all invasive species are considered ‘bad’, we use many of them for gardening, landscaping, food, and many other useful things, but that they often have negative impacts because they outcompete the native species.

**Exploratory Activity:**

Students will create their own story about a changing ecosystem in groups. Each group will be provided with magazines that they can use to cut out pictures of species from (or they will be given pre-printed species pictures) and will create an ecosystem using 5-10 of these animal, insect, and plant species. After allowing groups to set up and discuss their ecosystems, the instructor will introduce an invasive species into each ecosystem and will describe one specific effect that it will have (e.g. an introduced turtle eats fish from a pond faster than the fish can reproduce). Students will then discuss how the initial effect of this species can impact the rest of the ecosystem.

- Divide students into small groups, preferably 4-5 students per group.
- Provide each group with magazines (or with pre-printed sheets) showing 5-6 organisms of varying trophic levels (1-2 primary producers, 2 herbivores, a medium predator, and a top level predator) that all live in a certain ecosystem (desert, tundra, temperate forest, etc). Talk to the students about what these organisms prey on and what preys on them to give them a better starting point in creating their ecosystem.
- Begin the activity by explaining that each group will make a story about their ecosystem. Allow imaginative/creative answers. Have each person describe what one organism is doing in the ecosystem as well as how this affect another organism in the ecosystem. Continue going around the group for about 2-3 turns to get the 'story' established.
- Teacher will 'introduce' an invasive species into each ecosystem and will describe one specific effect that it will have. (For older age groups, students can hypothesize what the effects might of the introduced organism might be instead of the teacher providing them.) Have the students incorporate this organism and its effects into the story, noting how it will affect the already established organisms. It can cause a kind of ripple effect on the rest of the ecosystem.

**Explain:**

Students will share one thing that happened in their ecosystem and the effect that it had on another organism to the rest of the class. Have one or two students from each group share with the class.

**Extension Activity/Questions:**

Interactive tag game with specific roles for each student – predators (can tag prey), prey (can be tagged by predators or stationary plants), and stationary plants (can tag predators or prey). If students are tagged, they have been eaten and need to sit down – start with only a few predators so students can see how the system works. Add an invasive species into the next round that can tag out either the predators or the prey. After letting students play a round, have them explain how the addition of an invasive species affected the game and how many species were left in each group. Invasive species can be adapted to play a variety of roles in the game (can create boundary blocks, can take away certain areas of the floor, etc.).

**Evaluation Activity:**

Ask students to write down the definition of 'ecosystem' and 'invasive species'.